REMARKS

In the Office Action, Claims 1-23 were rejected as follows: Claims 1-3 were rejected based on a judicially created doctrine of nonstatutory obviousness-type double patenting ("ODP") as being unpatentable over Claims 1, 7 and 8 of U.S. Patent Application 10/691,903 (the "'903 appl."); [1] Claims 1-3 were rejected based on a judicially created doctrine of nonstatutory ODP as being unpatentable over Claims 1, 6 and 8 of U.S. Patent Application 10/692,894 (the "'894 appl."); [2] and Claims 1 and 2 were rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 6,865,237 to Boariu et al. in view of U.S. Patent Publication 2003/0174782 of Papadias et al.

The finding of allowable subject matter in Claims 3-23 is gratefully acknowledged.

Claims 1, 2 and 13 have been amended. New Claims 36 and 37 are presented. No new subject matter is added.

In regard to the ODP rejections, Claim 1, which was the only rejected independent claim, has been amended. It is believed that the amendment to Claim 1 overcomes each ODP rejection. The ODP rejections of Claims 2 and 3 are similarly inapplicable, at least in view of the dependency from Claim 1.

In addition, it is incorrect for this Office Action to have issued as a Final Office Action, at least in view of the apparent agreement that the ODP rejection should have been withdrawn in regard to Claim 3. Unlike the rejection of Claims 1 and 2, the only rejection of Claim 3 is an ODP rejection based on two later filed applications, as explained in the prior response. Accordingly, pursuant to the instruction provided at MPEP 804.I.B(1), as discussed in the prior response and highlighted by the Examiner in the *Response to Arguments* at page 2 of the Office Action, at least the ODP rejection of Claim 3 should have been withdrawn.

Claim 1 and new Claim 37 are the pending independent claims.

In the Office Action, independent Claim 1 and dependent Claim 2 were rejected as allegedly being unpatentable in view of the combination of Boariu et al. and Papadias et al. The combination of Boariu et al. and Papadias et al. fails to disclose performing space-time encoding (STC) and then phase rotation of some of the symbols, as claimed in the present application.

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[1] The PAIR system indicates that on November 15, 2007, a notice of allowance was mailed in the '903 appl.
[2] The PAIR system indicates that on October 31, 2007, the '894 appl. issued as U.S. 7,298,797.

Claim 1 has been amended to clarify that the present invention rotates the phases of some of the symbol combinations outputted from the space time encoder by using the transmission coding matrix. The amendment to Claim 1 divides the transmission coding matrix generator into "a space time encoder" and "a phase rotator part", for purposes of making the feature of performing phase rotation more clear. Like amended Claim 1, new Claim 37 rotates the phases of some of the symbol combinations by using the transmission coding matrix. The cited references of Boariu et al. and Papadias et al. fail to disclose or suggest such phase rotation.

The Office Action, at page 5, confirms that Boariu et al. is not explicit about symbols obtained by rotating the phases of some of the symbols once by a predetermined phase value. Papadias et al. was cited to cure this defect. Papadias et al. discloses rotating the phases of some of the symbols in the present invention. However, the scheme for performing the phase rotation in the present invention is not disclosed or suggested by Papadias et al., either alone or in combination with Boariu et al.

In regard to rotating the phase for the symbols, in the scheme taught by Papadias et al. the same phase rotation value is always applied to the corresponding symbol in a transmit matrix for rotating the phase. For example, referring to Fig. 5 in Papadias, the phase rotation value of $\exp(j\psi 1)$ is definitely applied to the symbol "b1" and then the symbol is input in a space-time encoder 140. Accordingly, Papadias et al. teaches that the symbol "b1" is STC encoded and then $b1\exp(j\psi 1)$ is always output from an antenna.

In Papadias et al., if de-multiplexing is performed and then the encoding and/or symbol-mapping is performed, the diversity gain is reduced. See, for example, the bit-interleaved coding scheme introduced by Bit-interleaved Coded Modulation, IEEE Trans. Inform. Theory, Vol. 44, No. 3, (May 1998), Giuseppe Caire, et al., as a coding scheme is used for a fast fading channel.

Contrary to Papadias et al., the present invention STC encodes the encoded and/or the symbol-mapped symbols, and then the phase rotation value of the symbol upon performing phase rotation can be changed every time when transmitting data. Accordingly, the present invention maximizes the diversity gain to which such variable phase rotation scheme is applied.

As explained at page 12, line 10, to page 13, line 18, of the specification of the present application, encoder (item 120 of Fig. 3 of the present invention) refers to an STC encoder that space-time encodes input symbols into a plurality of symbol combinations such that the combined symbol is transmitted once from each transmit antenna at each time period. The STC-

encoded symbols are then transmitted by rotating the phase by phase rotators (130a and 130b) connected to encoder (120).

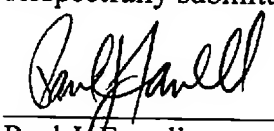
In other words, the present invention generally encodes and/or symbol-maps the transmit data, and then de-multiplexes the mapped input symbols (S1, S2, S3, S4), as shown in Fig. 3, and generates a transmission coding matrix to perform STC encoding and phase rotation. In contrast, Papadias et al. teaches de-multiplexing the primitive data stream and then encoding and/or symbol-mapping the de-multiplexed data stream through the encoder/mapper. (See item 135-1 to 135-4, respectively, of Fig. 5 of Papadias et al.) The order for encoding and/or symbol-mapping, and performing de-multiplex of Papadias et al. differs from the present invention. Boariu et al. fails to cure this defect.

In addition to the above, the present invention uses the scheme for STC encoding in the encoder (120) the symbols which are encoded and/or symbol-mapped according to a general method, and transmitting the symbols by rotating the phase by phase rotators (130a and 130b) connected to the encoder (120). To the contrary, Papadias et al. rotates the phase the encoded/the symbol-mapped symbols (as shown in Fig. 5 of Papadias et al.), and then STC encodes and transmits the symbol.

For at least the above reasons, the rejection of Claim 1 and Claim 2, which depends from Claim 1, should be withdrawn. New independent Claim 37 is believed to be similarly allowable, and allowable subject matter has been found in dependent Claims 3-23.

Accordingly, Claims 1-23 and 36-37 are believed to be in condition for allowance. If there are any questions or if additional information is required, please contact the undersigned at the telephone number listed below.

Respectfully submitted,



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